

Claims

What is claimed is:

1. A method of controlling operations that may be performed on a user-defined type (UDT) in a database system, where the UDT is derived from an underlying type having a set of underlying operations, the method including:
5 creating the UDT; and
 activating zero or more underlying operations for the UDT.
2. The method of claim 1, where the UDT is a distinct data type.
3. The method of claim 1, where creating the UDT includes:
10 accepting a CREATE TYPE query including a system operators clause including an operator list including zero or more operator elements, where each operator element corresponds to an underlying operation;
 and where activating the underlying operations includes:
 for each operator element listed in the operator list:
15 activating the corresponding underlying operation for the UDT.
4. The method of claim 3, where the operator list includes an ALL element, and where activating the underlying operations includes activating all underlying operations for the UDT.
5. The method of claim 1, where activating the underlying operations includes:
20 accepting an ALTER TYPE query including a system operators clause including an operator list including zero or more operator elements, where each operator element corresponds to an underlying operation; and
 for each operator element listed in the operator list:
 activating the corresponding underlying operation for the UDT.
6. The method of claim 1, where activating the underlying operations includes:
25 recording, in a data dictionary, the activated underlying operations for the UDT.

7. The method of claim 1, where one or more UDT columns are adapted to store UDT values, the method including:

accepting a query including a query operator that takes one or more operands, where one or more of the operands are UDT columns; and

5 determining whether the query operator is activated for the UDT of each UDT column, and if it is, performing the operation.

8. The method of claim 1, including:

activating one or more underlying operations for the UDT.

9. A computer program, stored on a tangible storage medium, for use in controlling operations that may be performed on a user-defined type (UDT) in a database system, where the UDT is derived from an underlying type having a set of underlying operations, the computer program including executable instructions that cause a computer to:

5 create the UDT; and

 activate zero or more underlying operations for the UDT.

10. The computer program of claim 9, where the UDT is a distinct data type.

11. The computer program of claim 9, where the executable instructions to create the UDT include executable instruction that cause the computer to:

10 accept a CREATE TYPE query including a system operators clause including an operator
 list including zero or more operator elements, where each operator element
 corresponds to an underlying operation;

 and where the executable instructions to activate the underlying operations include
 executable instruction that cause the computer to:

15 for each operator element listed in the operator list:

 activate the corresponding underlying operation for the UDT.

12. The computer program of claim 11, where the operator list includes an ALL element, and where the executable instructions to activate the underlying operations include executable instructions that cause the computer to activate all underlying operations for the UDT.

20 13. The computer program of claim 9, where the executable instructions to activate the zero or more operations include executable instructions that cause the computer to:

 accept an ALTER TYPE query including a system operators clause including an operator
 list including zero or more operator elements, where each operator element
 corresponds to an underlying operation; and

25 for each operator element listed in the operator list:

 activate the corresponding underlying operation for the UDT.

14. The computer program of claim 9, where the executable instructions to activate the underlying operations include executable instructions that cause the computer to:

record, in a data dictionary, the activated underlying operations for the UDT.

15. The computer program of claim 9, where one or more UDT columns are adapted to store

5 UDT values, and where the executable instructions cause the computer to:

accept a query including a query operator that takes one or more operands, where one or more of the operands are UDT columns; and

determine whether the query operator is activated for the UDT of each UDT column, and if it is, perform the operation.

16. A database system including:

a massively parallel processing system including:

one or more nodes;

5 a plurality of CPUs, each of the one or more nodes providing access to one or more CPUs;

a plurality of data storage facilities each of the one or more CPUs providing access to one or more data storage facilities;

10 a process for execution on the massively parallel processing system for controlling operations that may be performed on a user-defined type (UDT) in the database system, where the UDT is derived from an underlying type having a set of underlying operations, the process including:

creating the UDT; and

activating zero or more underlying operations for the UDT.

15 17. The database system of claim 16, where the UDT is a distinct data type.

18. The database system of claim 16, where creating the UDT includes:

accepting a CREATE TYPE query including a system operators clause including an operator list including zero or more operator elements, where each operator element corresponds to an underlying operation;

20 and where activating the underlying operations includes:

for each operator element listed in the operator list:

activating the corresponding underlying operation for the UDT.

19. The database system of claim 18, where the operator list includes an ALL element, and where activating the underlying operations includes activating all underlying operations for the UDT.

20. The database system of claim 16, where activating the underlying operations includes:

5 accepting an ALTER TYPE query including a system operators clause including an
 operator list including zero or more operator elements, where each operator
 element corresponds to an underlying operation; and
 for each operator element listed in the operator list:
 activating the corresponding underlying operation for the UDT.

10 21. The database system of claim 16, where activating the underlying operations includes:
 recording, in a data dictionary, the activated underlying operations for the UDT.

22. The database system of claim 16, where one or more UDT columns are adapted to store UDT values, the process including:

15 accepting a query including a query operator that takes one or more operands, where one
 or more of the operands are UDT columns; and
 determining whether the query operator is activated for the UDT of each UDT column,
 and if it is, performing the operation.